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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,959	03/01/2004	Takemori Takayama	03773/LH	2156

1933 7590 01/18/2007  
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC  
220 Fifth Avenue  
16TH Floor  
NEW YORK, NY 10001-7708

EXAMINER
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YEE, DEBORAH

ART UNIT	PAPER NUMBER
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1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/790,959

Applicant(s)

TAKAYAMA, TAKEMORI

Examiner

Deborah Yee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12,20--23 AND 25-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-8,10,11,12,20-23 and 25-27(contingent on correcting objections to informalities) is/are allowed.
- 6) ☒ Claim(s) 1 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1, 2, 9, 20 and 22 are objected to because of the following informalities:
2. Claim 9 recite "preheating the steel at room temperature or at a temperature equal to or lower than A1 temperature", and claim 22 recites "the steel is preheated at room temperature or at a temperature equal to or lower than A1 temperature". There appears to be typo-errors in these phrases since a steel can't be preheated to room temperature. It is recommended to change language to ---preheating the steel from room temperature to a temperature equal to or lower than the A1 temperature--- for claim 9; and ---preheated from room temperature to a temperature equal to or lower than the A1 temperature--- for claim 22 .
3. Also recited Markush groups should recite the wt% or vol% range by incorporating the word --total---. For example claim 1, twice recites "0.4 to 4.0% by volume of one or more compounds". It is recommended to use language such as ---a total amount of 0.4 to 4.0% by volume---. Same applies to claims 20
4. Claim 2 recites cementite particles containing 2.5 to 10 wt% Cr in the martensite surface layer yet Cr content is not actively recited as an alloying constituent in the steel composition. Note that the presence of Cr is necessary in order to form Cr cementite. Hence parent claim 1 or claim 2 should actively recite a Cr content, such as 0.3 to 1.5%Cr as recited by method claim 20.
5. Appropriate correction is required.

***Terminal Disclaimer***

6. The terminal disclaimer filed on 11-20-06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent 6,413,328 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 360005854 or Mitamura et al (US Patent 5,338,377) for the reasons set forth in the previous office action dated 8-25-06. Note claim 9 was inadvertently omitted from the previous office action but the reasons for rejection have already been stated in the previous office action wherein prior art teaches heating at high temperature followed by quenching similar to the present invention process limitations.

***Response to Arguments***

9. Applicant's arguments filed 11-20-06 have been fully considered but they are not persuasive. It was submitted that JP'854 and Mitamura do not teach a total amount of 0.4 to 4 vol.% of carbides, nitrides or carbonitrides or the soluble carbon concentration of 0.3 to 0.8% as recited in applicant's claim 1. It is the examiner's position that such properties would be expected since composition and process limitations are closely met, and in absence of proof to contrary. Moreover, similar to the present invention, prior art teaches a quench hardened martensitic matrix containing fine carbides, nitrides and/or carbonitrides with a particle diameter that overlap and suggest the claimed average particle diameter range of 0.2 to 5 microns.

***Allowable Subject Matter***

10. Claims 2 to 8, 10 to 12 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In addition, the objection to the informalities directed to claim 2 needs to be corrected.

11. Claims 20 to 23, 25 and 26 are allowable if informalities stated above are corrected. In addition the objection to informalities directed to claims 20 and 22 needs to be corrected.

13. The following is an examiner's statement of reasons for allowance: The art of record does not teach or fairly suggest a rolling element containing 2 to 15 vol%

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cementite particles containing 2.5 to 10 wt% Cr as an average composition dispersed in the martensite parent phase of the rolling contact surface layer; a steel containing 0.5 to 3%Si, 0.2 to 1.5%Al or 0.5 to 3.0%(Si+Al); a gear wherein teeth are quench hardened and generating compressive residual stress at the roots of the teeth; and method of producing a rolling element by quench hardening to produce a steel containing 2 to 15 vol% cementite dispersed within the martensitic phase.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-27211253. The examiner can normally be reached on monday-friday 6:00am-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Deborah Yee  
Primary Examiner  
Art Unit 1742

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